first secretary of agriculture in the President's cabinet. I based this statement upon the fact that the yearbook of the Department of Agriculture for 1888 contained the last report of N. J. Colman as commissioner of agriculture, and the yearbook of 1889, the first report of J. M. Rusk as secretary of agriculture. In his report Rusk states:

> I have the honor to respectfully submit my first annual report as secretary of agriculture, and the first report issued under the newly constituted Department of Agriculture. I assumed the duties of my office March 7, 1889, or twenty-six days after the approval of the law creating an executive department of what had heretofore been a bureau, in executive sense, of the government.

As no mention was made in either report of Colman having acted as secretary of agriculture during this short interval, I took it for granted that Rusk was the first secretary. I have received a letter from Dr. L. O. Howard, however, in which he states that Colman was really the first secretary of agriculture. He writes:

> Mr. Colman was commissioner of agriculture when the bill passed, and was appointed first secretary by President Cleveland on February 13, 1889, his services terminating with the outgoing of the administration on March 6, 1889.

G. P. Clinton

SCIENTIFIC BOOKS

Quantitative Laws in Biological Chemistry. By Svante Arrhenius. London, G. Bell and Sons, Ltd. 160 pp. 6 s. net.

The present volume is a restatement of the grounds upon which the illustrious author of the electrolytic dissociation theory arrived at the conviction that "biological chemistry can not develop into a real science without the aid of the exact methods offered by physical chemistry." It comprises a short résumé, developed with a remarkable degree of clarity and simplicity, of the author's work in the quantitative field of bio-chemistry, together with the investigations of others on neighboring ground. Originally, the material was compiled for the Tyndall lectures given in the Royal Institution in 1914, and is now offered to the public in the hope that it will evoke interest for the new discipline and stimulate new work.

A perusal of the volume, which deals mainly with the velocity of biochemical reactions, the influence of the several factors which govern such velocities and the position of equilibrium can not fail to impress the reader with certain facts. The fundamental import of a knowledge of physical, or rather theoretical, chemistry to the medical student of the future is readily grasped from these pages. The descriptive side of chemical science will more and more be found to be inadequate as a training for the complicated phenomena which the medical student will subsequently face. The volume shows that a real comprehension of the notions of experimental error, probable error and the like will open up to the student new and immense fields for research and for advance.

What is the chief task in that advance? It is to see how far the physico-chemical laws regarding the process of chemical reaction are applicable to biochemical processes and, what is much more important, to attempt to elucidate such processes as have been considered exceptions from known chemical laws. The yield which such an attempt will give is amply illustrated in the present work. It is hard to conceive an ungenerous attitude to a method which has elucidated so many organic processes. The well-known rule of Schutz is a case in point. It is shown that the deviation from the common monomolecular law is readily explainable on the basis of the influence of one of the reaction products on the course of the reaction. Further, the general law for such phenomena is as readily obtained and can be experimentally verified. The more complex phenomena of digestion, secretion and resorption in an animal's body may be shown, as the researches of Pawlow and his co-workers have established, to consist of a number of very simple regularities operating "in vivo" just as "in vitro" and extraordinarily independent of psychical effects and other factors which might lead to the belief that a quantitative study of such phenomena was impossible. As regards chemical equilibria mani-

fested in biochemical processes one can not refrain from contrasting, with Arrhenius, the explanation of the Ehrlich phenomenon on the basis of the law of mass action and that based on the assumption of multitudinous "partial poisons," toxins and toxoids, forming a characteristic if somewhat unintelligible "poison spectrum."

The book should operate as a stimulus and a spur. From personal contact the writer has reaped no small benefit and much inspiration in other branches of the scientific field. Could this volume attract the attention of some young student in the field of biochemical labors and induce in him the determination to go to the source and obtain personally the fruits of ripened thought and mature judgment progress would surely result. In the present pages there is manifest the characteristic genius of the author with his clarity of presentation of the particular thesis in hand. A few infelicities of English occasionally mar the text and suggest that perhaps the assistance of the English editor might have been a little more generously given. Words such as "inanimated" and "stomachical" might readily have been replaced.

HUGH S. TAYLOR

PRINCETON, N. J.

The Physiology of the Amino Acids. By FRANK P. UNDERHILL, Ph.D. Yale University Press. 1915. Pp. 169. Price $1.35.

It is truly symptomatic of modern scientific development that books should be written which divide physiology into physical and chemical portions, and that following this classification still finer divisions are introduced. One of these latter subdivisions is treated for the first time as an entity in Underhill's delightful little book, "The Physiology of the Amino Acids." Each known amino acid is enumerated and its discoverer given. Then follow those details which have thus far been unravelled regarding the intimate life history within the organism of the behavior of the structural units which compose the protein molecule. From the descriptions given in this book the reader may readily grasp the processes of synthesis and analysis, of oxidation and of reduction through the interplay of which protein under given conditions may be resolved into carbonic acid and urea, and under other conditions, into the texture of the living cells. For emphasis of the latter destiny Osborne and Mendel's experiments on the growth of rats form a fitting descriptive material. The book will be of interest and value to biologists in general and to physicians who have not forgotten their chemistry.

GRAHAM LUSK

SPECIAL ARTICLES

THE DISCOVERY OF THE CHESTNUT-BLIGHT PARASITE (ENDOTHIA PARASITICA) AND OTHER CHESTNUT FUNGI IN JAPAN

To Mr. Frank N. Meyer, agricultural explorer of the office of foreign seed and plant introduction of the Department of Agriculture, belongs the distinction of having discovered the chestnut-blight fungus (*Endothia parasitica*) in Japan as well as in China.[1, 2]

Meyer's discovery of the fungus in China has been accepted as proof of the oriental origin of this parasite which has proven so destructive to the chestnut in the northeastern United States and is rapidly spreading southward. Its discovery in Japan furnishes additional evidence as to the correctness of Metcalf's[3] hypothesis that the parasite was introduced into this country from Japan.

Meyer's discovery of *Endothia parasitica* in China made the presence of the same fungus in Japan seem extremely probable. And later, during her visit to this country in the fall of 1914, Dr. Johanna Westerdijk informed the writers that while in Japan she had seen at

[1] Fairchild, David, "The Discovery of the Chestnut-bark Disease in China," SCIENCE, N. S., Vol. 38, No. 974, pp. 297–299, August 29, 1913.

[2] Shear, C. L., and Stevens, Neil E., "The Chestnut-blight Parasite (*Endothia parasitica*) from China," SCIENCE, N. S., Vol. 38, No. 974, pp. 295–297, August 29, 1913.

[3] Metcalf, Haven, "The Immunity of the Japanese Chestnut to the Bark Disease," Bur. Plant Ind., U. S. Dept. Agr. Bull. 121, Pt. 6, 1908.